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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/806,177	07/16/2001	Rainer Schmid	SCH00051	5451

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EXAMINER
BELLAMY, TAMIKO D

ART UNIT	PAPER NUMBER
2856	

DATE MAILED: 08/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/806,177	SCHMID, RAINER	
	Examiner	Art Unit	
	Tamiko D. Bellamy	2856	

-- Th MAILING DATE of this communication appears on the cov r sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 August 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 July 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings are objected to because Fig. 2 contains more than one figure. Please renumber the figure as 2a-2c. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 2 is objected to because of the following informalities:

A) On line 3, change " the organic" to -- the insulating organic --.

3. Claim 12 is objected to because of the following informalities:

A) On line 1, change " the organic" to -- the insulating organic --.

4. Claim 14 is objected to because of the following informalities:

A) In step e, first line, change " the organic" to -- the insulating organic --.

5. Claim 15 is objected to because of the following informalities:

A) On line 2, change " waver" to -- wafer--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 8 and 20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specific limitations as to the thickness substrate wafer and the organic connecting layer is not discloses in the specification and is considered new matter.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-3, 5, and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Bernstein et al. (5,349,855).

With respect to claims 1 and 9, Bernstein et al. discloses in figs. 1, 1A, and 2 a substrate wafer (14), and a structural wafer (e.g. support element 46). The device of Bernstein et al. also discloses seismic masses (e.g., vibrating elements 18, 20), a suspension (e.g., support pillar 30), and a spring means (e.g., flexures 26, 28). Finally, Bernstein et al. discloses an that the substrate wafer (14) has a surface layer (12) formed as a dielectric such as silicon dioxide, which is equivalent to an insulating layer (col. 3, lines 55-58).

With respect to claim 2, Bernstein et al. discloses in figs. 1, 1A, and 2 discloses a substrate wafer (14) having a surface layer (12) formed as a dielectric such as silicon dioxide, which is equivalent to an insulating layer (col. 3, lines 55-58). Finally, as depicted in fig. 1 and 2, Bernstein et al. discloses planar detection electrodes (e.g., sense electrodes 54, 56) below support electrodes (22, 24). These planar detection electrodes (e.g., sense electrodes 54, 56) are alternatively beneath the below the seismic masses (18, 20) (col. 2, lines 4-7). The detection electrodes (e.g., sense electrodes 54, 56) are inherently made of a metal, which is equivalent to providing metallization on the substrate wafer (14) side facing the organic connecting layer (e.g., surface layer 12 formed as a dielectric).

With respect to claim 3, as depicted in figs. 1 and 1A, Bernstein et al. discloses a drive means (42, 38) that includes a stationary portion (e.g., drive electrode 42). Furthermore, Bernstein et al. discloses that the structural wafer (e.g., support element 46) is made of a metal (see fig. 1A). Bernstein et al. discloses a metallization for the assembly (16) and similar techniques are used form the drive electrodes (40, 42, 36, 38) and their supports (46, 44). (col. 6, lines 14-21).

With respect to 5, Bernstein et al. discloses in fig. 2, sense electrodes (54,56) below the insulating surface (e.g., surface layer 12) (col. 5, lines 67-68). As depicted in fig. 2, the sense electrodes (54, 56) are buried below the seismic mass (18).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 6, 7, 10-12, 14-18, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al. (5,349,855).

With respect to claim 6, Bernstein et al. discloses in figs. 1, 1A, and 2 a substrate wafer (14), and a structural wafer (e.g., support element 46). As depicted in figs. 1, 1A, and 2 the device of Bernstein discloses a substrate wafer (14) made of silicon, and a structural wafer (e.g., support element 46) made of metal or polysilicon (col. 2, lines 40-41). Bernstein et al. lacks the detail of the structural wafer (e.g., support element 46) made from monocrystalline silicon. However, the selection of a known material is a design consideration clearly within the preview of one having ordinary skill in the art. Therefore, to employ Bernstein et al. with structural wafer (e.g., support element 46) made from a monocrystalline silicon would have been obvious to one of ordinary skill in the at the time of the invention since this reference explicitly teaches its use structural wafer (e.g., support element 46) made from polysilicon.

With respect to claim 7, Bernstein et al. discloses figs. 1 and 2 a substrate wafer (14) having an insulating connection layer (e.g., surface layer 12 formed as a dielectric), and a structural wafer (e.g. support element 46). Bernstein et al. discloses that in the case of metallization for the assembly 16, a plating layer is layed down on top of the layer (12) Electro-forming steps are utilized to electroplate the assembly (16), the contact leads, and

the structural wafer (e.g. support element 46) (col. 6, lines 14-21). The contact leads are equivalent to connection metallization.

With respect to claims 10 and 21, Bernstein et al. disclose an evaluation circuit (e.g., sense electronics 72) that is interconnected to the assembly (16).

With respect to claims 11 and 12, Bernstein et al. discloses an that the substrate wafer (14) has a surface layer (12) formed as a dielectric such as silicon dioxide, which is equivalent to an insulating layer (col. 3, lines 55-58). Bernstein et al. lacks the detail of the organic connecting layer comprising a polymer such as polymide, epoxy resin, or thermoplastic materials. However, the court held in In re Leshin, 227 F.2d 197, 125 USPQ 416 (CCPA 1960), that the selection of a known material based upon its suitability for the intended use is a design consideration clearly within the preview of one having ordinary skill in the art. Therefore, to employ Bernstein et al. with an insulating layer comprising a polymide, epoxy resin, or thermoplastic materials would have been obvious to one of ordinary skill in the at the time of the invention since this reference explicitly teaches its use a vibrating elements in a rotatable assembly which include an insulating layer.

With respect to claim 14, Bernstein et al. discloses all the limitations of the claim accept for removing the organic layer at least below the seismic mass. However, the method that Bernstein et al. uses is inherently capable of removing a portion of the insulating layer. Bernstein et al. specifically states in col. 2, lines 20-37 that wafer bonding techniques may also be utilized to deposit on top of silicon substrate, by bonding contributed by a second wafer which is etch removed leaving a highly doped layer

configured to provide the structure of rotationally supported assembly (col. 2, lines 20-37). Therefore, to employ Bernstein et al. with a insulating layer having a portion removed below the seismic mass would have been obvious to one of ordinary skill in the at the time of the invention since this reference explicitly teaches use of an insulating layer (e.g., surface layer (12) formed as a dielectric such as silicon dioxide) and utilizes wafer bonding techniques.

With respect to claims 15 and 16, Bernstein et al. discloses in figs. 1, 1A, and 2 discloses a semiconductor wafer (e.g., substrate wafer (14)). Finally, as depicted in fig. 1 and 2, Bernstein et al. discloses planar detection electrodes (e.g., sense electrodes 54, 56) below support electrodes (22, 24). These planar detection electrodes (e.g., sense electrodes 54, 56) are alternatively beneath the below the seismic masses (18, 20) (col. 2, lines 4-7). The detection electrodes (e.g., sense electrodes 54, 56) are inherently made of a metal, which is equivalent to providing metallization on the semiconductor wafer (e.g., substrate wafer (14)).

With respect to claim 17, Bernstein et al. discloses a structural wafer (e.g. support element 46). The supported assembly may also be fabricated by selective etching (col. 2, lines 26-30).

With respect to claim 18, Bernstein et al. discloses in fig. 2 an organic connection layer (e.g. surface layer (12) formed from a dielectric such as silicon dioxide). The wafer bonding utilized to deposit on top of the substrate (14) contributed by a second wafer may be etch removed (col. 2, lines 31-35).

11. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al. (5,349,855) in view of O'Brien et al. (5,392,650).

With respect to claim 13, Bernstein et al. discloses a substrate wafer (14), and a structural wafer (e.g. support element 46). Bernstein et al. lacks the detail of a cover wafer. O'Brien et al. discloses cover wafer (e.g., top glass plate 72). Furthermore, O'Brien et al. discloses a gap between the moving portions and the glass plates (col. 12, line 3-10). Therefore, to modify Bernstein et al. by employing a cover wafer would have been obvious to one of ordinary skill in the art at the time of the invention since O'Brien et al. teaches a micromechanical device having theses design characteristics. The skilled artisan would be motivated to combine the teachings of Bernstein et al. and O'Brien et al. since Bernstein et al. states that his invention is applicable to a microfabricated device having vibrating elements supported in a rotating assembly and O'Brien et al. is directed to sensors of acceleration and rotation.

12. Claims 4 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al. (5,349,855) in view of Muenzel et al. (5,959,208).

With respect to claims 4 and 19, Bernstein et al. discloses seismic masses (e.g., vibrating elements 18, 20). Bernstein et al. lacks the detail of the seismic mass having through holes. As depicted in fig. 1, the device of Muenzel et al. discloses a seismic mass (7) having through holes. Therefore, to modify Bernstein et al. by employing a seismic mass having through would have been obvious to one of ordinary skill in the art

at the time of the invention since Muenzel et al. teaches a micromechanical device having theses design characteristics. The skilled artisan would be motivated to combine the teachings of Bernstein et al. and Muenzel et al. since Bernstein et al. states that his invention is applicable to a microfabricated device having vibrating elements supported in a rotating assembly and Muenzel et al. is directed to mounting an accelerometer on a vibrational system of a rate of rotation sensor that is configured out of a three-layer system (col. 1, lines 64-67, col. 2, line 1).

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tamiko D. Bellamy whose telephone number is (703) 305-4971. The examiner can normally be reached on Monday through Friday 9:00 AM to 6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (703) 305-4705. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

Tamiko Bellamy
T. B.
July 27, 2003

HEZRON WILLIAMS
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